Dark adaptation impairment in patients with drusen

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Purpose

The functional impairment induced by drusen in age-related macular degeneration (AMD) is not fully characterized. The purpose of this study is to evaluate the difference between patients with drusen and controls in terms of dark adaptation (DA), and to explore the differences by drusen type, namely soft drusen and reticular pseudodrusen (RPD).

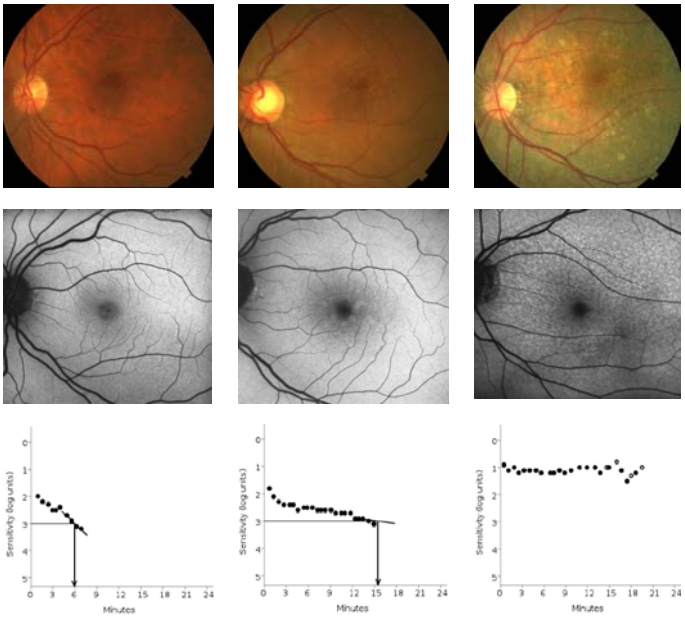

Figure. Representative fundus autofluorescence images (top) and dark adaptometry (bottom) images from controls (left), soft drusen (middle) and reticular pseudodrusen (right) individuals.

Results

We included 29 eyes of 29 patients, 19 with drusen (12 soft drusen, 7 RPD) and 10 controls. Patients with drusen showed a higher RIT than controls (20 vs 5,78 minutes, p=0.0001). A larger percentage of patients with drusen showed an abnormal RIT as compared to controls (89.5% vs 10%, p=0.001). A statistically significant difference was found between RIT in patients with soft drusen and RPD, 17.58 vs 20 (p=0.02). All eyes with RPD had a RIT>20. Drusen (p<0,001) and age (p=0.016) were associated with a larger RIT after adjustment for sex and visual acuity.

Methods

Prospective, cross-sectional, observational study. Patients aged ≥50 with predominant soft drusen or RPD associated with early AMD in one eye with no other ocular comorbidities and healthy controls were selected. Two experienced observers classified fundus images as showing predominantly soft drusen, RPD or none. DA (AdaptDx®, Maculogix, Hummelstown, PA) was performed in all subjects. Rod Intercept Time (RIT, the time to recover visual sensitivity to $5x10^{-3}$ scot cd/m^2), was the main variable. A RIT>12 minutes was considered abnormal. [(1)] If after 20 minutes the RIT could not be determined, subject was considered to have a RIT of 20 minutes. The comparison of median RIT between groups was the main outcome.

	Control (n=10)	Drusen (n=19)	p-value
Age (years)	67.0	71	0.30
Women (%)	90	84.2	1.00
Visual Acuity (letters)	85.0	84.0	0.27
Family History of AMD (%)	40.0	42.11	1.00
RIT (minutes)	5.78	20.0	0.0001

Table 1. Comparison of baseline features and of the main outcome between groups (Mann-Whitney test) . AMD: age-related macular degeneration; RIT: rod-intercept time.

Conclusion

Patients with drusen showed larger RIT (worse DA) than healthy controls. In this sample, 89,5% of patients with drusen showed an abnormal RIT. The time to recover visual sensitivity could not be determined in any patient with RPD (>20 min), suggesting very poor DA. Larger series are needed to confirm these differences between drusen types.

References and Disclosures

(1) Jackson GR, Edwards JG. J Ocul Biol Dis Infor. 2008; 1: 7–11. (2) Flamendof J et al. Ophthalmology 2015; 122: 2053-62,
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